AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. - 17. (Canceled)

18. (New) A method of transferring data in a communication system, comprising:

receiving a plurality of registration requests from a radio access network (RAN) node, wherein each registration request identifies a corresponding mobile node;

receiving a plurality of data packets, wherein each of the plurality of data packets is destined for a respective mobile node and corresponds to a respective data packet treatment;

establishing a plurality of tunnels with the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of air-interface links between the RAN node and the respective mobile node; and

transmitting each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

19. (New) The method of claim 18, wherein the establishing further comprises enabling the RAN node to reorder respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel.

20. (New) The method of claim 18, wherein the establishing further comprises indicating to the RAN node whether or not the respective data packets carried by the respective tunnel can be dropped.

21. (New) The method of claim 18, wherein the establishing further comprises each of the plurality of tunnels having a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

22. (New) The method of claim 18, wherein the establishing is in response to the receiving of a respective one of the plurality of data packets having a respective data packet treatment.

23. (New) The method of claim 18, wherein the establishing further comprises:

enabling the RAN node to reorder respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel;

indicating to the RAN node whether or not the respective data packets carried by the respective tunnel can be dropped; and

wherein each of the plurality of tunnels comprises a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

24. (New) The method of claim 18, wherein the number of the plurality of tunnels is greater than the number of the air-interface links.

25. (New) The method of claim 18, wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information.

26. (New) The method of claim 25, wherein establishing further comprises translating each respective signaling information into a respective code point value understood by the RAN node.

27. (New) The method of claim 18, wherein receiving the plurality of registration requests further comprises receiving a respective routing key with each registration request, wherein each respective routing key is generated by the RAN node and comprises a first field and a second field, wherein the first field identifies the respective corresponding mobile node, wherein the second field is reserved for indicating a tunnel identifier, wherein the routing key further comprises a variable set by the RAN node to variably allocate resources between a plurality of mobile nodes and a respective plurality of tunnels.

28. (New) The method of claim 27, wherein the variable set by the RAN node to variably allocate resources is based on at least one of historical usage of mobile nodes, or available data services.

29. (New) The method of claim 27, wherein the variable comprises a field length of the routing key or a variable alternate field.

30. (New) The method of claim 27, wherein the variable comprises the first field and the second field each having a variable field length.

31. (New) The method of claim 27, wherein establishing the plurality of tunnels with the RAN node for each respective mobile node further comprises generating a tunnel identifier according to the second field.

32. (New) The method of claim 18, wherein receiving the plurality of registration requests further comprises receiving a respective Generic Routing Encapsulation (GRE) key with each registration request, wherein each GRE key is generated by the RAN node and comprises a packet service identifier (PSI) field and a tunnel identifier (MTID) field, wherein the PSI field identifies the respective corresponding mobile node, and wherein the MTID field identifies a value corresponding to an available number of tunnels that may be established.

33. (New) The method of claim 32, wherein establishing the plurality of tunnels with the RAN node for each respective mobile node further comprises generating a tunnel identifier corresponding to one of the available number of tunnels.

34. (New) The method of claim 32, wherein receiving the plurality of registration requests further comprises receiving a respective GRE header comprising the GRE key and a sequence number corresponding to a sequence space, wherein each of the plurality of tunnels have different respective sequence spaces.

35. (New) The method of claim 18, further comprising receiving a back-pressure message from the RAN node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels.

36. (New) The method of claim 18, wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information, wherein establishing further comprises translating each respective signaling information into a respective code point value understood by the RAN node, and further comprising receiving a back-pressure message from the RAN node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels and wherein the back-pressure message is based on a respective code point corresponding to the respective one of the plurality of tunnels.

37. (New) At least one processor configured to transfer data in a communication system, comprising:

a first module for receiving a plurality of registration requests from a radio access network (RAN) node, wherein each registration request identifies a corresponding mobile node;

a second module for receiving a plurality of data packets, wherein each of the plurality of data packets is destined for a respective mobile node and corresponds to a respective data packet treatment;

a third module for establishing a plurality of tunnels with the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of air-interface links between the RAN node and the respective mobile node; and

a fourth module for transmitting each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

38. (New) A software module residing in a memory and configured to transfer data in a communication system, comprising:

at least one computer-readable instruction operable to cause a computer to receive a plurality of registration requests from a radio access network (RAN) node, wherein each registration request identifies a corresponding mobile node;

at least one computer-readable instruction operable to cause the computer to receive a plurality of data packets, wherein each of the plurality of data packets is destined for a respective mobile node and corresponds to a respective data packet treatment;

at least one computer-readable instruction operable to cause the computer to establish a plurality of tunnels with the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of air-interface links between the RAN node and the respective mobile node; and

at least one computer-readable instruction operable to cause the computer to transmit each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

39. (New) An apparatus configured to transfer data in a communication system, comprising:

means for receiving a plurality of registration requests from a radio access network (RAN) node, wherein each registration request identifies a corresponding mobile node;

means for receiving a plurality of data packets, wherein each of the plurality of data packets is destined for a respective mobile node and corresponds to a respective data packet treatment;

means for establishing a plurality of tunnels with the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of air-interface links between the RAN node and the respective mobile node; and

means for transmitting each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

40. (New) An apparatus configured to transfer data in a communication system, comprising:

a memory storage device comprising computer-readable instructions operable to:

receive a plurality of registration requests from a radio access network (RAN) node, wherein each registration request identifies a corresponding mobile node;

receive a plurality of data packets, wherein each of the plurality of data packets is destined for a respective mobile node and corresponds to a respective data packet treatment;

establish a plurality of tunnels with the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of air-interface links between the RAN node and the respective mobile node; and

transmit each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment; and

a processor adapted for executing the computer-readable instructions.

41. (New) The apparatus of claim 40, wherein the computer-readable instructions to establish the plurality of tunnels further comprise computer-readable instructions to enable the RAN node to reorder respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel.

42. (New) The apparatus of claim 40, wherein the computer-readable instructions to establish the plurality of tunnels further comprise computer-readable instructions to indicate to the RAN node whether or not the respective data packets carried by the respective tunnel can be dropped.

43. (New) The apparatus of claim 40, wherein each of the plurality of tunnels comprises a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

44. (New) The apparatus of claim 40, wherein the computer-readable instructions to establish the plurality of tunnels further comprise computer-readable instructions responsive to receiving of a respective one of the plurality of data packets having a respective data packet treatment.

45. (New) The apparatus of claim 40, wherein the computer-readable instructions to establish the plurality of tunnels further comprise computer-readable instructions to:

enable the RAN node to reorder respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel;

indicate to the RAN node whether or not the respective data packets carried by the respective tunnel can be dropped; and

wherein each of the plurality of tunnels comprises a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

46. (New) The apparatus of claim 40, wherein the number of the plurality of tunnels is greater than the number of the air-interface links.

47. (New) The apparatus of claim 40 wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information.

48. (New) The apparatus of claim 47, wherein the computer-readable instructions to establish the plurality of tunnels further comprise computer-readable instructions to translate each respective signaling information into a respective code point value understood by the RAN node.

49. (New) The apparatus of claim 40, wherein each of the plurality of registration requests further comprise a respective routing key, wherein each respective routing key is generated by the RAN node and comprises a first field and a second field, wherein the first field identifies the respective corresponding mobile node, wherein the second field is reserved for indicating a tunnel identifier, wherein the routing key further comprises a variable set by the RAN node to variably allocate resources between a plurality of mobile nodes and a respective plurality of tunnels.

50. (New) The apparatus of claim 49, wherein the variable set by the RAN node to variably allocate resources is based on at least one of historical usage of mobile nodes, or available data services.

51. (New) The apparatus of claim 49, wherein the variable comprises a field length of the routing key or a variable alternate field.

52. (New) The apparatus of claim 49, wherein the variable comprises the first field and the second field each having a variable field length.

53. (New) The apparatus of claim 49, wherein the computer-readable instructions to establish the plurality of tunnels further comprise computer-readable instructions to generate a tunnel identifier according to the second field.

54. (New) The apparatus of claim 40, wherein each of the plurality of registration requests further comprises a respective Generic Routing Encapsulation (GRE) key, wherein each GRE key is generated by the RAN node and comprises a packet service identifier (PSI) field and a tunnel identifier (MTID) field, wherein the PSI field identifies the respective corresponding mobile node, and wherein the MTID field identifies a value corresponding to an available number of tunnels that may be established.

55. (New) The apparatus of claim 54, wherein the computer-readable instructions to establish the plurality of tunnels further comprise computer-readable instructions to generate a tunnel identifier corresponding to one of the available number of tunnels.

56. (New) The apparatus of claim 54, wherein each of the plurality of registration requests further comprises a respective GRE header comprising the GRE key and a sequence number corresponding to a sequence space, wherein each of the plurality of tunnels have different respective sequence spaces.

57. (New) The apparatus of claim 40, further comprising computer-readable instructions to receive a back-pressure message from the RAN node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels.

58. (New) The apparatus of claim 40, wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information, wherein establishing further comprises translating each respective signaling information into a respective code point value understood by the RAN node, and further comprising receiving a back-pressure message from the RAN node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels and wherein the back-pressure message is based on a respective code point corresponding to the respective one of the plurality of tunnels.

59. (New) A method of transferring data in a communication system, comprising:

transmitting a plurality of registration requests from a radio access network (RAN) node to a network access node, wherein each registration request identifies a corresponding mobile node;

receiving information from the network access node to establish a plurality of tunnels between the network access node and the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment corresponding to a respective one of a plurality of data packets received by the network access node, wherein each of the plurality of data packets received by the network access node is destined for a respective mobile node and comprises a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of the air-link interfaces between the RAN node and the respective mobile node; and

receiving each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

60. (New) The method of claim 59, further comprising forwarding each respective one of the plurality of data packets to the corresponding mobile node.

61. (New) The method of claim 60, further comprising establishing the number of air-interface links between the RAN node and each respective mobile node, wherein the forwarding further comprises forwarding via a respective air-interface link.

62. (New) The method of claim 59, wherein the receiving of the information to establish the plurality of tunnels further comprises enabling reordering respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel.

63. (New) The method of claim 59, wherein the receiving of the information to establish the plurality of tunnels further comprises receiving an indication as to whether or not the respective data packets carried by the respective tunnel can be dropped.

64. (New) The method of claim 59, wherein each of the plurality of tunnels comprise a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

65. (New) The method of claim 59, wherein the receiving of the information to establish the plurality of tunnels further comprises a response to the network access node receiving of a respective one of the plurality of data packets having a respective data packet treatment.

66. (New) The method of claim 59, wherein the receiving of the information to establish the plurality of tunnels further comprises:

enabling reordering of respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel;

receiving an indication as to whether or not the respective data packets carried by the respective tunnel can be dropped; and

wherein each of the plurality of tunnels comprises a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

67. (New) The method of claim 59, wherein the number of the plurality of tunnels is greater than the number of the air-interface links.

68. (New) The method of claim 59, wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information.

69. (New) The method of claim 68, wherein the receiving of the information to establish the plurality of tunnels further comprises receiving respective signaling information translated into respective code point values understood by the RAN node.

70. (New) The method of claim 59, wherein transmitting the plurality of registration requests further comprises transmitting a respective routing key with each registration request, wherein each respective routing key is generated by the RAN node and comprises a first field and a second field, wherein the first field identifies the respective corresponding mobile node, wherein the second field is reserved for indicating a tunnel identifier, wherein the routing key further comprises a variable set by the RAN node to variably allocate resources between a plurality of mobile nodes and a respective plurality of tunnels.

71. (New) The method of claim 70, wherein the variable is based on at least one of historical usage of mobile nodes, or available data services.

72. (New) The method of claim 70, wherein the variable comprises a field length of the routing key or a variable alternate field.

73. (New) The method of claim 70, wherein the variable comprises the first field and the second field each having a variable field length.

74. (New) The method of claim 70, wherein the receiving of the information to establish the plurality of tunnels further comprises receiving a tunnel identifier according to the second field.

75. (New) The method of claim 59, wherein transmitting the plurality of registration requests further comprises transmitting a respective Generic Routing Encapsulation (GRE) key with each registration request, wherein each GRE key is generated by the RAN node and comprises a packet service identifier (PSI) field and a tunnel identifier (MTID) field, wherein the PSI field identifies the respective corresponding mobile node, and wherein the MTID field identifies a value corresponding to an available number of tunnels that may be established.

76. (New) The method of claim 75, wherein the receiving of the information to establish the plurality of tunnels further comprises receiving a tunnel identifier corresponding to one of the available number of tunnels.

77. (New) The method of claim 75, wherein transmitting the plurality of registration requests further comprises transmitting a respective GRE header comprising the GRE key and a sequence number corresponding to a sequence space, wherein each of the plurality of tunnels have different respective sequence spaces.

78. (New) The method of claim 59, further comprising transmitting a back-pressure message to the network access node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels.

79. (New) The method of claim 59, wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information, wherein the receiving of the information to establish the plurality of tunnels further comprises receiving respective signaling information translated into a respective code point value understood by the RAN node, and further comprising transmitting a back-pressure message to the network access node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels and wherein the back-pressure message is based on a respective code point corresponding to the respective one of the plurality of tunnels.

80. (New) At least one processor configured to transfer data in a communication system, comprising:

a first module for transmitting a plurality of registration requests from a radio access network (RAN) node to a network access node, wherein each registration request identifies a corresponding mobile node;

a second module for receiving information from the network access node to establish a plurality of tunnels between the network access node and the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment corresponding to a respective one of a plurality of data packets received by the network access node, wherein each of the plurality of data packets received by the network access node is destined for a respective mobile node and comprises a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of the air-link interfaces between the RAN node and the respective mobile node; and

a third module for receiving each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

81. (New) A software module residing in a memory and configured to transfer data in a communication system, comprising:

at least one computer-readable instruction operable to cause a computer to transmit a plurality of registration requests from a radio access network (RAN) node to a network access node, wherein each registration request identifies a corresponding mobile node;

at least one computer-readable instruction operable to cause the computer to receive information from the network access node to establish a plurality of tunnels between the network access node and the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment corresponding to a respective one of a plurality of data packets received by the network access node, wherein each of the plurality of data packets received by the network access node is destined for a respective mobile node and comprises a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of the air-link interfaces between the RAN node and the respective mobile node; and

at least one computer-readable instruction operable to cause the computer to receive each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

82. (New) An apparatus configured to transfer data in a communication system, comprising:

means for transmitting a plurality of registration requests from a radio access network (RAN) node to a network access node, wherein each registration request identifies a corresponding mobile node;

means for receiving information from the network access node to establish a plurality of tunnels between the network access node and the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment corresponding to a respective one of a plurality of data packets received by the network access node, wherein each of the plurality of data packets received by the network access node is destined for a respective mobile node and comprises a respective data packet treatment, wherein a number of the plurality of tunnels is independent of a number of the air-link interfaces between the RAN node and the respective mobile node; and

means for receiving each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment.

83. (New) An apparatus configured to transfer data in a communication system, comprising:

a memory storage device comprising computer-readable instructions operable to:

transmit a plurality of registration requests from a radio access network (RAN) node to a network access node, wherein each registration request identifies a corresponding mobile node;

receive information from the network access node to establish a plurality of tunnels between the network access node and the RAN node for each respective mobile node, wherein each of the plurality of tunnels corresponds to a respective data packet treatment corresponding to a respective one of a plurality of data packets received by the network access node, wherein each of the plurality of data packets received by the network access node is destined for a respective mobile node and comprises a respective data packet treatment, wherein

a number of the plurality of tunnels is independent of a number of the air-link interfaces between the RAN node and the respective mobile node; and

receive each of the plurality of data packets over a respective one of the plurality of tunnels according to the respective data packet treatment; and

a processor adapted for executing the computer-readable instructions.

84. (New) The apparatus of claim 83, further comprising computer-readable instructions operable to forward each respective one of the plurality of data packets to the corresponding mobile node.

85. (New) The apparatus of claim 84, further comprising computer-readable instructions operable to establish the number of air-interface links between the RAN node and each respective mobile node, wherein the forwarding further comprises forwarding via a respective air-interface link.

86. (New) The apparatus of claim 83, wherein the computer-readable instructions operable to receive the information to establish the plurality of tunnels further comprise computer-readable instructions operable to enable reordering respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel.

87. (New) The apparatus of claim 83, wherein the computer-readable instructions operable to receive the information to establish the plurality of tunnels further comprise computer-readable instructions operable to receive an indication as to whether or not the respective data packets carried by the respective tunnel can be dropped.

88. (New) The apparatus of claim 83, wherein each of the plurality of tunnels comprise a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

89. (New) The apparatus of claim 83, wherein the information to establish the plurality of tunnels is received in response to the network access node receiving a respective one of the plurality of data packets having a respective data packet treatment.

90. (New) The apparatus of claim 83, wherein the information to establish the plurality of tunnels further comprises:

information enabling reordering of respective data packets in different tunnels to coexist with an absence of data packet reordering within each individual tunnel;

information indicating whether or not the respective data packets carried by the respective tunnel can be dropped; and

wherein each of the plurality of tunnels comprises a different at least one tunnel attribute corresponding to a different one of the respective data packet treatments.

91. (New) The apparatus of claim 83, wherein the number of the plurality of tunnels is greater than the number of air-interface links.

92. (New) The apparatus of claim 83, wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information.

93. (New) The apparatus of claim 92, wherein the information to establish the plurality of tunnels further comprises respective signaling information translated into respective code point values understood by the RAN node.

94. (New) The apparatus of claim 83, wherein each the plurality of registration requests further comprises a respective routing key, wherein each respective routing key is generated by the RAN node and comprises a first field and a second field, wherein the first field identifies the respective corresponding mobile node, wherein the second field is reserved for indicating a tunnel identifier, wherein the routing key further comprises a variable set by the RAN node to variably allocate resources between a plurality of mobile nodes and a respective plurality of tunnels.

95. (New) The apparatus of claim 94, wherein the variable is based on at least one of historical usage of mobile nodes, or available data services.

96. (New) The apparatus of claim 94, wherein the variable comprises a field length of the routing key or a variable alternate field.

97. (New) The apparatus of claim 94, wherein the variable comprises the first field and the second field each having a variable field length.

98. (New) The apparatus of claim 94, wherein the receiving of the information to establish the plurality of tunnels further comprises receiving a tunnel identifier according to the second field.

99. (New) The apparatus of claim 83, wherein each of the plurality of registration requests further comprises a respective Generic Routing Encapsulation (GRE) key, wherein each GRE key is generated by the RAN node and comprises a packet service identifier (PSI) field and a tunnel identifier (MTID) field, wherein the PSI field identifies and the respective corresponding mobile node, and wherein the MTID field identifies a value corresponding to an available number of tunnels that may be established.

100. (New) The apparatus of claim 99, wherein the information to establish the plurality of tunnels further comprises a tunnel identifier corresponding to one of the available number of tunnels.

101. (New) The apparatus of claim 99, wherein each of the plurality of registration requests further comprises a respective GRE header comprising the GRE key and a sequence number corresponding to a sequence space, wherein each of the plurality of tunnels have different respective sequence spaces.

102. (New) The apparatus of claim 83, further comprising computer-readable instructions operable to transmit a back-pressure message to the network access node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels.

103. (New) The apparatus of claim 83, wherein each respective data packet treatment comprises signaling information comprising at least one of a Differentiated Service Code Point (DSCP) marking, or Service Level Agreement (SLA) information, or Resource ReSerVation Protocol (RSVP) information, wherein the information to establish the plurality of tunnels further comprises respective signaling information translated into a respective code point value understood by the RAN node, and further comprising computer-readable instructions operable to transmit a back-pressure message to the network access node, wherein the back-pressure message corresponds to a respective one of the plurality of tunnels and wherein the back-pressure message is based on a respective code point corresponding to the respective one of the plurality of tunnels.